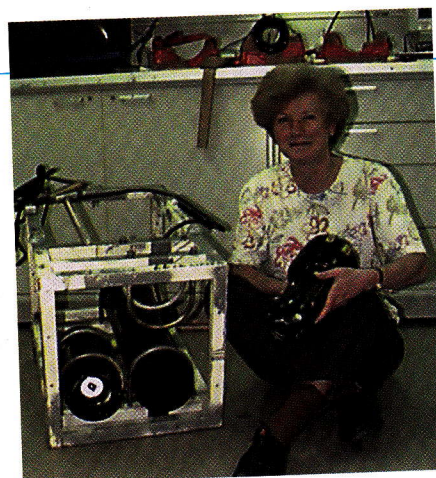


Across Canada

Did you know that ocean water covers about 70 percent of Earth's surface? As a high school student, Verena Tunnicliffe was torn between studying this fascinating fluid — or Russian history. The ocean won out. Today, Dr. Tunnicliffe is a professor at the School of Earth and Ocean Sciences, located at the University of Victoria in British Columbia.

Currently, Dr. Tunnicliffe is studying fish communities off the coast of British Columbia. She is especially interested in how global warming and other climate changes affect these communities. She is also investigating ecosystems surrounding deep-sea thermal vents. Thermal vents are ocean-floor openings that release hot water and gases from deep inside Earth. Certain species of bacteria thrive around deep-sea thermal vents. The bacteria serve as food for other species of clams, crabs, and sea worms, which are among the creatures Dr. Tunnicliffe studies.

Dr. Tunnicliffe conducts much of her research 2 or 3 km below the surface of the ocean. To descend to the bottom of the sea, she and her colleagues climb into a research submersible,



Dr. Verena Tunnicliffe

which holds three people in a steel ball about 2 m across. Conditions in the submersible are cramped and cold, but most of the time Dr. Tunnicliffe doesn't mind. She is too interested in her research and what it may reveal. "In a rapidly changing world of great environmental challenges," she says, "even the distant ocean depths may hold important lessons for humanity."

Check Your Understanding

- Copy and complete the table shown here.

Property	Measuring instrument	Unit
		g
density		
	graduated cylinder	
		N

- A block of an unknown metal measures . The block has a mass of 235 g. Of what metal do you think the block is made? Would this metal float or sink in mercury?
- What does buoyant force mean?
 - What does displace mean?
- Explain how you can make plastic sink and steel float.
- What is meant by average density?
- State Archimedes' principle.
- If the buoyant force is less than the weight of an object immersed in a fluid, what will happen to the object?
 - If the buoyant force equals the object's weight, what will happen to the object?
 - Give an example of what can happen when the buoyant force on an object is greater than the weight of the object.
- Design Your Own** Design an experiment to determine whether liquids can exert a buoyant force on other liquids. Make sure your procedure is approved by your teacher before you carry out your experiment.